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Lichens from one locality at Frederikshåbs Isblink and two localities in the Fiskenæsset area, South West Greenland

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Abstract: A total of 156 taxa of lichens are reported from one locality near Frederikshåbs Isblink and two localities north and east of Fiskenæsset in South West Greenland. 23 taxa are new to the Frederikshåb and Fiskenæsset region. Geology, climate and vegetation of the three localities are briefly treated.

Kokkuvõte: Edela-Gröönimaa kolme leiukoha (Frederikshåbs Isblink ja kaks leiukohta Fiskenæsset piirkonnas) samblikud

Teatatakse 156 samblikuliigi leidmisest Edela-Gröönimaal. 23 liiki on uued mainitud aladele. Lühidalt tutvustatakse nende alade geoloogiat, kliimat ja taimkatet.

INTRODUCTION

The lichen flora of South West Greenland has been explored by numerous lichenologists, for example, Alstrup (1982), Dahl (1950), K. Hansen (1971) and the author (E. S. Hansen, 1978, 1993, 2000, 2008), and should be considered as well known. This also applies to the Frederikshåb District and its surroundings (Branth & Grønlund, 1888; Thomson, 1984, 1997). However, part of this very extensive area still contains "white spots", which have not been investigated lichenologically. Such spots occur in many places near Frederikshåbs Isblink and in the mountainous region east of Fiskenæsset/Qeqertarsuatsiaat. These areas were visited by the author in the summer of 2009. The aim of the present paper is to bring a survey of the lichen vegetation occurring at three selected localities in the areas and to present a list of their lichen content. During the same summer the author also studied the lichen flora of J. A. D. Jensens Nunatakker (Hansen, 2010a).

Localities and geology

The following three localities were investigated by the author (Fig. 1):

1. Frederikshåbs Isblink. 62°37'N 50°08'W. 6–11 July 2009. Archaean gneisses and other types of siliceous rocks (Escher & Stuart Watt, 1976). Lichenological investigations were carried out in dwarf shrub heaths, fell-fields, fens and rocks and boulders (0–100 m) (Fig. 2).
2. Qeqertaq. 63°12'N 50°20'W. 14 July 2009. Archaean gneisses. Dwarf shrub heaths and different saxicolous lichen communities (0–100 m) were studied.
3. Surroundings of Midgaard GEUS base camp. 63°14'N 50°36'W. 30 June–3 July & 11–16 July 2009. Archaean gneisses and other types of siliceous rocks. Dwarf shrub heaths, fell-fields, willow scrubs and snow-patches (0–300 m) were investigated (Fig. 3, 4).

Climate

The investigation area has a low arctic and oceanic climate. The mean temperature of the warmest month, July, is 5°C at Frederikshåb, whereas the mean temperature of the coldest month, February, is -6°C according to measurements made by Asiaq/Grønlands Forundersøgelser. The annual precipitation is 876 mm (data for the year 2000). However, the climate of the investigated localities is somewhat drier than the hyperoceanic Frederikshåb.

MATERIAL AND METHODS

Lichens were collected by the author at numerous sample spots at three localities, viz. one locality near Frederikshåbs Isblink and

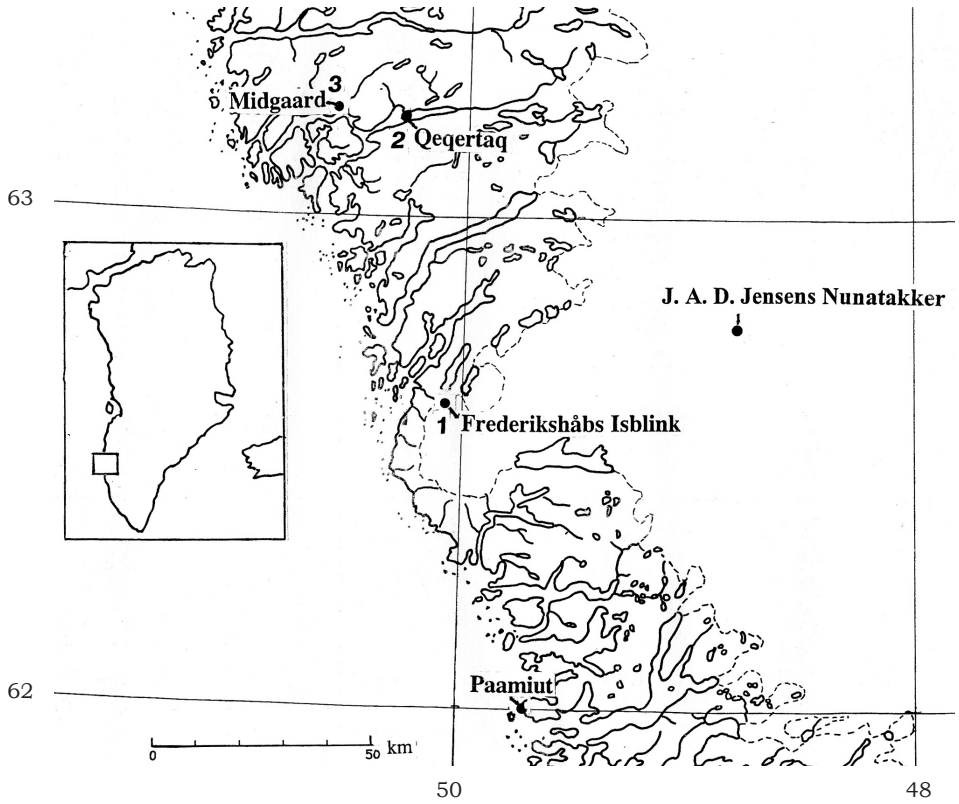

Fig. 1. Location of the three studied localities in South West Greenland: 1 – Frederikshåbs Isblink, 2 – Qeqertaq, 3 – Midgaard. The small Greenland map shows the position of the investigation area.

two localities north and east of Fiskenæsset/ Qeqertarsuatsiaat, Midgaard and the island Qeqertaq, in late June and in July 2009.The collected material, a total of c. 400 specimens of lichens, was studied with Zeiss light microscopes. Numerous collections of *Lepraria* await further chemical investigations and are excluded from the present paper. The material is deposited in the herbarium of the Botanical Museum, University of Copenhagen (C). 15 lichen species were collected for fascicle 32 & 33 of "Lichenes Groenlandici Exsiccati" (LGE).

RESULTS AND DISCUSSION

General remarks on the lichen vegetation

The present investigation resulted in 23 additional lichen taxa for the whole region. Of the 157 lichens reported in the present study, 65 taxa are terricolous, 7 corticolous and 71 saxicolous. The remaining are either muscicolous or lichenicolous. Many lichens are able to grow on different substrates, for example, on soil, litter and mosses. In the following some selected plant communities more or less rich in lichens are described.

1. Terricolous lichen vegetation

Mixed dwarf shrub-lichen heaths are of great importance in the surroundings of the Midgaard GEUS base camp (Fig. 3). *Betula nana* (up to 0.5 m high), *Empetrum hermaphroditum*, *Ledum groenlandicum* and *Vaccinium uliginosum* are the dominant dwarf shrubs, although their individual frequency in the heaths varies to some extent. *Cladonia stellaris* and *C. stygia* are usually the dominant lichens, but species such as *Cetraria islandica*, *Cladonia bellidiflora*, *C.*

Fig. 2. View of the border zone of Frederikshåbs Isblink from a stony ridge near the camp.

Fig. 3. The Midgaard base camp is surrounded by hills with dwarf shrub heaths rich in lichens.

Fig. 4. Up to more than two meter high shrubs of *Salix glauca* carrying a characteristical corticolous lichen vegetation near the Midgaard base camp.

cornuta, *C. crispata*, *C. ecmocyna*, *C. floerkeana*, *C. macroceras*, *C. mitis*, *C. sulphurina*, *Flavocetraria cucullata*, *F. nivalis*, *Icmadophila ericetorum*, *Nephroma arcticum*, *Ochrolechia alaskana*, *Peltigera scabrosa*, *Stereocaulon alpinum* and *S. paschale* are also relatively common. The more sporadic occurrence of *Peltigera kristinssonii* and *P. neckeri* is noteworthy. Both species are comparatively rare in oceanic areas (Vitikainen, 1994). Patches with *Arctocetraria andrejevii*, *A. simmonsii*, *Cetrariella delisei* and *Cladonia trassii* occur in moist places in the heaths. *Arthrorhaphis citrinella*, *Baeomyces rufus* and *Candelariella canadensis* are pioneers on bare soil.

Vegetation mosaics consisting of *Betula nana*, *Empetrum hermaphroditum* and lichens such as *Alectoria ochroleuca*, *Bryocaulon divergens*, *Bryoria chalybeiformis*, *Cladonia stellaris*, *Flavocetraria nivalis* and *Pertusaria dactylina* occur in more or less wind-blown areas somewhat above the base camp. A well-developed snow bed community with *Harrimanella hypnoides*, *Salix herbacea*, *Pertusaria oculata* and *Solorina crocea* (dominant) occurs at altitudes above c. 200 m (Fig. 4).

Dwarf shrub heaths are also of great importance on Qeqertaq, but they are comparatively poor in lichens. *Bryoria chalybeiformis* and *Gowardia nigricans* are common in wind-blown places, while species such as *Arctocetraria andrejevii*, *Cetraria islandica*, *C. nigricans*, *Cladonia bellidiflora*, *C. borealis*, *C. rangiferina*, *C. stellaris*, *C. sulphurina* and *Flavocetraria nivalis* prefer protected habitats in the heaths.

Heath mosaics with *Betula nana*, *Empetrum hermaphroditum*, *Ledum groenlandicum*, *Salix glauca* and *Vaccinium uliginosum* dominate in the investigation area at Frederikshåbs Isblink. Their lichen composition is similar to that of the Midgaard area mentioned above. *Lichenomphalia hudsoniana* is very common in the mossy tussocks in marshy patches. *Alectoria sarmentosa* ssp. *vexillifera* occurs abundantly on wind-blown hills in the area. *Flavocetraria cucullata* and *F. nivalis* are also common in this habitat, while the otherwise common fell-field lichen, *Thamnolia vermicularis*, apparently was neglected during the present study.

The above described terricolous lichen communities are typical for South West Greenland. However, the biota is poor in eutrophic species, i. e. lichens restricted to neutral or alkaline soil.

Thus the species of *Catapyrenium, Psora* and *Solorina* (apart from *S. crocea*) were not found during the present investigation. This is a striking difference compared with the lichen biota of, for example, Arsuk (Hansen, 2008).

2. Corticolous lichen vegetation

Salix glauca forms up to 1 m high scrubs in the Midgaard area. *Cetraria sepincola*, *Lecanora fuscescens*, *Nephroma bellum*, *N. parile*, *Parmeliopsis ambigua*, *P. hyperopta* and *Vulpicida pinastri* grow on willow branches (the last mentioned species grows also on branches of *Juniperus communis*). The flora of epiphytic lichens is rather poor compared with that of areas with a somewhat warmer summer climate (Alstrup, 1982). However, most of the corticolous species belong to the somewhat continental element in Greenland (Hansen, 1971; Hansen, 2010c). *Biatora vernalis*, *Cladonia fimbriata*, *Lopadium coralloideum*, *Parmelia saxatilis*, *Psoroma hypnorum*, *P. tenue* and *Varicellaria rhodocarpa* were all found growing on decaying branches of *Salix glauca* in the Midgaard area or in the studied area near Frederikshåbs Isblink. This type of corticolous lichen vegetation is widely distributed in South West Greenland (Alstrup 1982).

3. Saxicolous lichen vegetation

The following three types of saxicolous lichen vegetation are of primary importance in the investigation areas: lichen vegetation on siliceous rocks without visible influence of nitrogenous matters, vegetation dominated by rust-stained lichens, and ornithocoprophilous lichen vegatation. Different *Umbilicaria* species, for example, *U. cylindrica*, *U. havaasii*, *U. hyperborea*, *U. nylanderiana*, *U. proboscidea*, *U. rigida* and *U. torrefacta* occur more or less commonly on dry, siliceous rocks and boulders. They are associated with other macrolichens such as *Arctoparmelia centrifuga*, *A. incurva*, *Brodoa oroarctica*, *Candelariella coralliza*, *Melanelia hepatizon*, *Parmelia omphalodes*, *P. saxatilis*, *Pseudephebe minuscula*, *P. pubescens*, *Sphaerophorus fragilis*, *Stereocaulon botryosum*, *S. vesuvianum*, *Umbilicaria virginis* and several microlichens, for example, *Amygdalaria panaeola*, *Aspicilia mastoidea*, *Bellemerea cinereorufescens*, *Euopsis pulvinata*, *Lecidea lapicida* var. *lapicida*, *L. lapicida* var. *pantherina*, *Lecidea tesselata*, *Ochrolechia tartarea*, *Orphniospora moriopsis*, *Rhizocarpon geographicum*, *R. grande*, *R. inarense* and *R. rittokense*. Some species, e.g. *Peltigera collina*, *Umbilicaria cinereorufescens* and *U. polyphylla,* prefer dry, warm boulders in willow scrubs (Hansen, 1971). Heavily wind-blown rocks hold lichens such as *Ophioparma ventosa* and *Calvitimela aglaea*. Moderately moist rock surfaces are covered by lichens such as *Ephebe hispidula*, *Ionaspis lacustris*, *Rhizocarpon lavatum*, *Staurothele fuscocuprea*, *Umbilicaria deusta* and *U. vellea*. Moist, limonite-covered rocks and stones secundarily influenced by iron from a metal construction support the following lichens: *Acarospora sinopica*, *Placopsis gelida*, *Porpidia flavocaerulescens*, *P. flavicunda*, *Stereocaulon nanodes* and *Tremolecia atrata*. In urban areas, *Stereocaulon nanodes* is associated with, for example, iron railings and roadside walls (Smith et al., 2009). The nitrophilous lichen vegetation is represented by the following species: *Candelariella coralliza*, *Lecanora contractula* (and its lichen parasite, *Caloplaca alcarum*), *Parmelia sulcata*, *Physcia caesia*, *P. dubia*, *Protoparmelia badia*, *Umbilicaria arctica*, *Xanthoria candelaria*, *X. elegans* and *X. sorediata* (the last mentioned species on overhanging rock faces). *Candelariella coralliza* is comparatively rare in Greenland apart from its south-western part (Hansen, 1978; Alstrup et al., 2009; Thomson, 1997).

The lichenometric studies carried out in the investigation area mainly deal with *Rhizocarpon geographicum*. Almost fourty years ago, Keith Pitman (1973) reported on a fairly high growth rate for *Rhizocarpon geographicum* in the Frederikshåb distict, viz. 1 mm every 4.4 years. So far the author has not measured such a high growth rate for this species, neither in West Greenland nor in East Greenland (Hansen, 2010b).

Annotated list of lichens

The following list of lichens presents the results of the author´s collection activities. The list cannot be considered representative as regards, for example, *Aspicilia*, *Caloplaca* and a number of lecideoid lichens, which have been observed, but not collected during the present investigation. Lichenicolous fungi were not dealt with. Nomenclature follows Santesson et al. (2004) with some exceptions. Numbers 1, 2 and 3 indicate the three localities listed above. Annotations are given as regards the substrate of the lichens. An asterisk (*) preceding the name indicates that the taxon is an addition to the known lichen flora of the Frederikshåb and Fiskenæsset

area. The presence of apothecia or perithecia is indicated by ”ap” and ”pe” respectively; sterile specimens are indicated by ”st”. The frequency is mentioned, where it was possible to estimate it. The following estimation classes are used: rare, common, locally abundant. Collections, which are distributed from herbarium C as part of “Lichenes Groenlandici Exsiccati” (LGE) are stated by their numbers.

Acarospora sinopica (Wahlenb.) Körb. – 1. On siliceous stone with limonite coating; st.; rare.

Alectoria ochroleuca (Hoffm.) A. Massal. – 1, 3. On soil; st. LGE 1088, 1090.

Alectoria sarmentosa (Ach.) Ach. ssp. vexillifera (Nyl.) D. Hawksw. – 1. On soil; st. LGE 1091.

Amygdalaria panaeola (Ach.) Hertel & Brodo – 3. On siliceous rocks; st.

Arctocetraria andrejevii (Oxner) Kärnefelt & A. Thell – 2, 3. On soil; st. LGE 1081.

Arctocetraria simmonsii (Krog) E. S. Hansen – 3. On soil; st.

Arctoparmelia centrifuga (L.) Hale – 1, 2, 3. On siliceous rocks; st. LGE 1074.

Arctoparmelia incurva (Pers.) Hale – 1, 3. On siliceous rock; st.

Arthrorhaphis citrinella (Ach.) Poelt – 1. On soil; st.

Aspicilia berntii A. Nordin, Tibell & Owe-Larss. – 3. On siliceous rocks; ap.

Baeomyces carneus Flörke – 1. On soil; st.

Baeomyces rufus (Huds.) Rebent. – 2, 3. On soil and clayey soil; ap, st.

* Bellemerea alpina (Sommerf.) Clauzade & Cl. Roux – 1. On siliceous rock; ap.

Bellemerea cinereorufescens (Ach.) Clauzade & Cl. Roux – 3. On siliceous rocks; ap.

Biatora vernalis (L.) Fr. – 1. On dead twig of *Salix glauca*; ap.

Brodoa oroarctica (Krog) Goward – 1, 3. On siliceous rocks; ap, st.

Bryocaulon divergens (Ach.) Kärnefelt – 1, 3. On soil; st.

Bryoria chalybeiformis (L.) Brodo & D. Hawksw. – 1, 2, 3. On soil; st; common. LGE 1085.

Caloplaca alcarum Poelt – 1. On siliceous rock; ap.

Calvitimela aglaea (Sommerf.) Hafellner – 1. On siliceous rock; ap.

*Candelariella coralliza (Nyl.) H. Magn. – 3. On manured, siliceous rock; st.

* Candelariella canadensis H. Magn. – 2. On soil; st.

Cetraria islandica (L.) Ach. – 1, 2 ,3. On soil; st; common. LGE 1089.

Cetraria nigricans Nyl. – 2, 3. On soil; st.

*Cetraria sepincola (Ehrh.) Ach. – 3. On branch of *Salix glauca*; ap.

Cetrariella commixta (Nyl.) A. Thell & Kärnefelt – 3. On siliceous rock; ap.

Cetrariella delisei (Bory ex Schaer.) Kärnefelt & A. Thell – 2, 3. On soil; ap, st. LGE 1087.

Cladonia amaurocraea (Flörke) Schaer. – 1. On soil; st.

Cladonia bellidiflora (Ach.) Schaer. – 2, 3. On soil; ap, st. LGE 1070.

Cladonia borealis S. Stenroos – 2. On soil; ap.

Cladonia carneola (Fr.) Fr. – 3. On soil; ap, st.

Cladonia chlorophaea (Flörke ex Sommerf.) Spreng. – 2, 3. On soil; ap, st.

Cladonia coccifera (L.) Willd. – 1, 3. On soil; ap.

Cladonia cornuta (L.) Hoffm. – 1, 3. On soil; st.

Cladonia crispata (Ach.) Flot. – 2, 3. On soil; st.

Cladonia ecmocyna Leight. – 3. On soil; ap, st..

*Cladonia fimbriata (L.) Fr. – 1, 3. On soil, bark of *Salix* and old wood; st.

Cladonia floerkeana (Fr.) Flörke – 3. On soil; ap.

Cladonia gracilis (L.) Willd. – 3. On soil; st.

Cladonia luteoalba Wheldon & A. Wilson – 1, 2. On soil; st.

* Cladonia macroceras (Delise) Hav. – 1, 2, 3. On soil; ap, st.

Cladonia macrophylla (Schaer.) Stenh. – 3. On soil; ap.

Cladonia macrophyllodes Nyl. – 3. On soil; st.

Cladonia mitis Sandst. – 1, 2, 3. On soil; st.

Cladonia phyllophora Hoffm. – 1. On soil; st.

Cladonia pleurota (Flörke) Schaer. – 1, 2, 3. On soil; ap, st.

Cladonia pocillum (Ach.) Grognot – 1. On soil; st.

Cladonia pyxidata (L.) Hoffm. – 1, 2. On soil; st.

Cladonia rangiferina (L.) F. H. Wigg. – 1, 2. On soil; st; locally abundant. LGE 1092.

Cladonia squamosa Hoffm. – 2, 3. On soil; st.

Cladonia stellaris (Opiz) Pouzar & Vězda – 1, 2, 3. On soil; st; common. LGE 1080, 1093.

Cladonia stygia (Fr.) Ruoss – 1, 3. On soil; st.

Cladonia subfurcata (Nyl.) Arnold – 3. On soil; ap.

Cladonia sulphurina (Michx.) Fr. – 2, 3. On soil; ap, st. LGE 1071.

Cladonia trassii Ahti – 3. On soil; st.

Cladonia uncialis (L.) Weber ex F. H. Wigg. – 1, 2, 3. On soil; ap, st.

Ephebe hispidula (Ach.) Horw. – 3. On moist, siliceous rock; st.

* Euopsis pulvinata (Schaer.) Vain. – 3. On siliceous rock; ap.
Flavocetraria cucullata (Bellardi) Kärnefelt & A. Thell – 1, 3. On soil; st.
Flavocetraria nivalis (L.) Kärnefelt & A. Thell – 1, 2, 3. On soil; ap, st. LGE 1082.
Frutidella caesioatra (Schaer.) Kalb – 1, 3. Over mosses on siliceous rock; ap.
* Fuscopannaria praetermissa (Nyl.) P. M. Jørg. – 3. On soil; st.
Gowardia nigricans (Ach.) P. Halonen, L. Myllys, S. Velmala & H. Hyvärinen – 1, 2, 3. On soil; st.
*Icmadophila ericetorum (L.) Zahlbr. – 2, 3. Over mosses on soil; ap.
Ionaspis lacustris (With.) Lutzoni – 1, 3. On moist, siliceous stones; ap.
Lecanora contractula Nyl. – 1. On siliceous rock; ap.
Lecanora fuscescens (Sommerf.) Nyl. – 3. On twig of *Salix glauca*; ap.
Lecanora intricata (Ach.) Ach. – 2, 3. On siliceous rock; ap.
Lecanora polytropa (Ehrh. ex Hoffm.) Rabenh. – 1, 3. On siliceous rock; ap.
Lecidea lapicida (Ach.) Ach. var. lapicida – 1. On siliceous rock; ap.
Lecidea lapicida (Ach.) Ach. var. pantherina Ach. – 2, 3. On siliceous rocks; ap, st.
* Lecidea tesselata Flörke – 1. On siliceous rock; ap.
Lecidoma demissum (Rutstr.) Gotth. Schneid. & Hertel – 3. On soil; ap.
Leprocaulon subalbicans (I. M. Lamb) I. M. Lamb & A. M. Ward – 1, 2, 3. Over mosses on siliceous rock.
Lichenomphalia hudsoniana (H. S. Jenn.) Redhead et al. – 1, 3. On soil and mosses.
* Lopadium coralloideum (Nyl.) Lynge – 1. On dead branch of *Salix glauca*; ap.
Massalongia carnosa (Dicks.) Körb. – 3. Over mosses on soil; st.
Melanelia hepatizon (Ach.) A. Thell – 1, 2, 3. On siliceous rock; ap, st.
* Melanelia stygia (L.) Essl. – 3. On siliceous rocks; st.
Melanohalea elegantula (Zahlbr.) O.Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch – 3. On manured, siliceous rock; st.
Micarea assimilata (Nyl.) Coppins – 3. Over mosses on soil; ap.
Miriquidica nigroleprosa (Vain.) Hertel & Rambold – 3. On siliceous rock; ap.
Nephroma arcticum (L.) Torss. – 1, 2, 3. On soil; st; locally abundant. LGE 1083.
*Nephroma bellum (Spreng.) Tuck. – 3. On bark of *Salix glauca*; ap.
Nephroma parile (Ach.) Ach. – 3. On branches of *Salix glauca*; st.
Ochrolechia alaskana (Verseghy) Kukwa – 1, 2, 3. On plant remains; ap, st. Cortex reacts C+ yellow (Kukwa, 2009).
Ochrolechia tartarea (L.) A. Massal. – 1. On siliceous rock; ap.
Ophioparma ventosa (L.) Norman – 1, 3. On siliceous rock; ap.
Orphniospora moriopsis (A. Massal.) D. Hawksw. – 1, 2, 3. On siliceous rock; ap.
Parmelia omphalodes (L.) Ach. – 1, 2. On siliceous rocks; st.
Parmelia saxatilis (L.) Ach. – 1, 2, 3. On siliceous rocks, and branch of *Salix glauca*; st.
Parmelia sulcata Taylor 1, 2, 3. On manured, siliceous rocks; st.
Parmeliopsis ambigua (Wulfen) Nyl. – 3. On branches of *Salix glauca*; st.
Parmeliopsis hyperopta (Ach.) Arnold – 3. On branches of *Salix glauca* and *Juniperus communis*; st.
Peltigera aphthosa (L.) Willd. – 1, 3. Among mosses on soil; st.
Peltigera collina (Ach.) Schrad. – 1. On siliceous rock; st.
Peltigera didactyla (With.) J. R. Laundon – 1. On soil; st.
*Peltigera kristinssonii Vitik. – 3. Among mosses on soil; st.
Peltigera occidentalis (E. Dahl) Kristins. – 3. Among mosses on soil; st. – Known from a few localities in South West and Central West Greenland. It is common in North America (Brodo et al. 2001, Hansen 1995).
Peltigera rufescens (Weiss) Humb. – 3. Among mosses on soil; st.
Peltigera scabrosa Th. Fr. – 1, 2, 3. Among mosses on soil; ap.
Pertusaria dactylina (Ach.) Nyl. – 3. On soil; ap, st.
Pertusaria geminipara (Th. Fr.) C. Knight ex Brodo – 3. Over mosses on soil; st.
Pertusaria oculata (Dicks.) Th. Fr. – 1, 2, 3. On dead twig and plant remains; ap, st.
Physcia caesia (Hoffm.) Fürnr. – 1. On manured, siliceous rocks; st.
Physcia dubia (Hoffm.) Lettau – 2, 3. On manured, siliceous rock; st.

Placopsis gelida (L.) Linds. – 1. On siliceous stones; st. LGE 1073.

* Polychidium muscicola (Sw.) Gray – 3. Over mosses on siliceous rock; ap.

Porpidia flavocaerulescens (Hornem.) Hertel & A. J. Schwab – 2, 3. On siliceous rock; ap, st.

Porpidia flavicunda (Ach.) Gowan – 1, 2, 3. On siliceous stones with and without limonite coating; ap.

Protoparmelia badia (Hoffm.) Hafellner – 3. On manured, siliceous rocks; ap.

Pseudephebe minuscula (Nyl. ex Arnold) Brodo & D. Hawksw. – 1, 3. On siliceous rocks; st; common.

Pseudephebe pubescens (L.) M. Choisy – 2, 3. On siliceous rock; st.

Psoroma hypnorum (Vahl) Gray – 1. Over mosses on soil, on branch of *Salix glauca*, on soil; ap.

Psoroma tenue Henssen var. boreale Henssen – 3. Over mosses on soil, on branches of *Salix glauca*; ap. – *Psoroma tenue* appears to be just as common as *P. hypnorum* in Greenland (Jørgensen 2004).

Rhizocarpon badioatrum (Flörke ex Spreng.) Th. Fr. – 3. On siliceous rocks; ap.

* Rhizocarpon copelandii (Körb.) Th. Fr. – 1. On siliceous rock; ap.

Rhizocarpon geographicum (L.) DC. – 1, 2, 3. On siliceous rock; ap; common.

Rhizocarpon grande (Flörke) Arnold – 1, 3. On siliceous stones; ap.

Rhizocarpon hochstetteri (Körb.) Vain. – 1. On siliceous stones; ap.

Rhizocarpon inarense (Vain.) Vain. – 1. On siliceous rocks; ap.

Rhizocarpon lavatum (Fr.) Hazsl. – 1, 3. On moist, siliceous stones; ap.

Rhizocarpon rittokense (Hellb.) Th. Fr. – 1, 3. On siliceous rock; ap.

* Rhizocarpon subareolatum E. S. Hansen – 3. On *Rhizocarpon grande* on siliceous rock; ap; rare. – *S*o far known from a few localities in North West and North East Greenland (Hansen 2007).

Rinodina turfacea (Wahlenb.) Körb. – 1. On plant remains; ap.

Solorina crocea (L.) Ach. – 1, 2, 3. On soil; ap; locally abundant. Nos 1 and 54 are infested by *Rhagadostoma lichenicola* (de Not.) Keissl.

Sphaerophorus fragilis (L.) Pers. – 1, 2, 3. On soil and rocks; ap, st.

Sphaerophorus globosus (Huds.) Vain. – 1, 3. On soil; st.

* Staurothele fuscocuprea (Nyl.) Zschacke – 1. On siliceous stone; pe.

Stereocaulon alpinum Laurer – 3. On soil; st.

Stereocaulon botryosum Ach. – 1, 3. On siliceous rocks; st.

* Stereocaulon condensatum Hoffm. – 3. On plant remains; ap.

Stereocaulon glareosum (Savicz) H. Magn. – 2, 3. On soil; ap, st.

* Stereocaulon nanodes Tuck. – 3. On siliceous stones influenced by iron from a metal construction in the Midgaard base camp; st.

Stereocaulon paschale (L.) Hoffm. – 1, 3. On soil; ap, st. LGE 1086.

Stereocaulon vesuvianum Pers. – 2, 3. On siliceous rock; st.

* Trapeliopsis granulosa (Hoffm.) Lumbsch – 3. On soil; ap.

Tremolecia atrata (Ach.) Hertel – 1. On siliceos stones with limonite coating, siliceous rock; ap.

Umbilicaria arctica (Ach.) Nyl. – 1, 2, 3. On manured, siliceous rock; ap. LGE 1094.

Umbilicaria cinereorufescens (Schaer.) Frey – 3. On siliceous rock; st.

Umbilicaria cylindrica (L.) Delise ex Duby – 3. On siliceous rocks; ap, st.

Umbilicaria deusta (L.) Baumg. – 3. On siliceous rocks; ap, st.

Umbilicaria havaasii Llano – 1, 3. On siliceous rock; st. LGE 1084.

Umbilicaria hyperborea (Ach.) Hoffm. – 2, 3. On siliceous rock; ap.

* Umbilicaria nylanderiana (Zahlbr.) H. Magn. – 1, 3. On siliceous rock; ap.

Umbilicaria polyphylla (L.) Baumg. – 3. On siliceous rocks; st.

Umbilicaria proboscidea (L.) Schrad. – 1, 2, 3. On siliceous rock; ap, st.

Umbilicaria rigida (Du Rietz) Frey – 1, 3. On siliceous rock; ap.

Umbilicaria torrefacta (Lightf.) Schrad. – 1, 3. On siliceous rocks; ap.

Umbilicaria vellea (L.) Hoffm. – 1, 3. On siliceous rock; st.

Umbilicaria virginis Schaer. – 2, 3. On siliceous rock; ap.

* Varicellaria rhodocarpa (Körb.) Th. Fr. – 1. On dead twigs; st.

Vulpicida pinastri (Scop.) J.-E. Mattsson & M. J. Lai – 3. On branch of *Salix glauca*; st.

Xanthoria candelaria (L.) Th. Fr. – 1, 2, 3. On manured, siliceous rocks; ap, st. LGE 1072.

XANTHORIA ELEGANS (Link) Th. Fr. – 1. On manured, siliceous rocks; ap.

XANTHORIA SOREDIATA (Vain.) Poelt – 3. On manured, siliceous rock; st.

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